



## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2022-0515; Project Identifier AD-2022-00287-E]**

**RIN 2120-AA64**

#### **Airworthiness Directives; CFM International, S.A. Turbofan Engines**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** The FAA proposes to adopt a new airworthiness directive (AD) for certain CFM International, S.A. (CFM) LEAP-1B model turbofan engines. This proposed AD was prompted by multiple commanded in-flight shutdowns (IFSDs) due to inner radial drive shaft (RDS) failure. This proposed AD would require initial and repetitive inspections of the transfer gearbox (TGB) scavenge screens and, depending on the results of the inspections, replacement or rework of the affected inner RDS. As a mandatory terminating action to the initial and repetitive inspections of the TGB scavenge screens, this proposed AD would require replacement or rework of the affected inner RDS. This proposed AD would also prohibit the installation of an engine with an affected inner RDS onto an airplane that already has one engine with an affected inner RDS installed. The FAA is proposing this AD to address the unsafe condition on these products.

**DATES:** The FAA must receive comments on this proposed AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <https://www.regulations.gov>. Follow the instructions for submitting comments.

- Fax: (202) 493-2251.

- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For service information identified in this NPRM, contact CFM International, S.A., Aviation Operations Center, 1 Neumann Way, M/D Room 285, Cincinnati, OH 45125; phone: (877) 432-3272; email: [fleetsupport@ge.com](mailto:fleetsupport@ge.com). You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222-5110.

### **Examining the AD Docket**

You may examine the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2022-0515; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this NPRM, any comments received, and other information. The street address for Docket Operations is listed above.

**FOR FURTHER INFORMATION CONTACT:** Mehdi Lamnyi, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7743; email: [Mehdi.Lamnyi@faa.gov](mailto:Mehdi.Lamnyi@faa.gov).

### **SUPPLEMENTARY INFORMATION:**

#### **Comments Invited**

The FAA invites you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under ADDRESSES. Include “Docket No. FAA-2022-0515; Project Identifier AD-2022-00287-E” at the beginning of your comments. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. The FAA will consider all comments received by the closing date and may amend this proposal because of those comments.

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in 14 CFR 11.35, the FAA will post all comments received, without change, to <https://www.regulations.gov>, including any

personal information you provide. The agency will also post a report summarizing each substantive verbal contact received about this NPRM.

### **Confidential Business Information**

CBI is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this NPRM contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this NPRM, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as “PROPIN.” The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public docket of this NPRM. Submissions containing CBI should be sent to Mehdi Lamnyi, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803. Any commentary that the FAA receives which is not specifically designated as CBI will be placed in the public docket for this rulemaking.

### **Background**

The FAA received reports of multiple IFSDs on CFM LEAP-1B21, LEAP-1B23, LEAP-1B25, LEAP-1B27, LEAP-1B28, LEAP-1B28B1, LEAP-1B28B2, LEAP-1B28B2C, LEAP-1B28B3, LEAP-1B28BBJ1, and LEAP-1B28BBJ2 (LEAP-1B) model turbofan engines beginning in August 2018. The manufacturer’s investigations determined that some of these IFSD events were the result of inadequate oil flow to the RDS bearing, which caused the RDS bearing and RDS bearing cage to fail. The FAA issued AD 2019-12-01, Amendment 39-19656 (84 FR 28202, June 18, 2019), which required initial and repetitive inspections of the TGB scavenge screens and, depending on the results of the inspection, possible removal of the engine from service.

After the FAA issued AD 2019-12-01, further investigation by the manufacturer identified an additional contributing factor to the RDS bearing failures. The manufacturer revised the service information to include a repetitive TGB screen inspection until the RDS accumulates 1,500 flight hours (FHs) since new and borescope inspections of the RDS bearing at 1,500 FHs since new and 6,000 FHs since new. The FAA superseded AD

2019-12-01 by issuing AD 2020-06-01, Amendment 39-21103 (85 FR 14413, March 12, 2020), which requires revision to the airworthiness limitations section (ALS) of the applicable engine shop manual to incorporate the new inspections.

Since the FAA issued AD 2020-06-01, the FAA received further reports of commanded IFSDs due to inner RDS failure. The manufacturer initiated an investigation and identified a subpopulation of inner RDS susceptible to rivet fatigue failure occurring after the inspection thresholds required by the ALS revision in AD 2020-06-01. This condition, if not addressed, could result in failure of one or more engines, loss of thrust control, and loss of the airplane.

#### **FAA's Determination**

The FAA is issuing this NPRM after determining that the unsafe condition described previously is likely to exist or develop on other products of the same type design.

#### **Related Service Information Under 1 CFR Part 51**

The FAA reviewed CFM Service Bulletin (SB) LEAP-1B-72-00-0365-01A-930A-D, Issue 003-00, dated April 26, 2022 (CFM LEAP-1B-72-00-0365-01A-930A-D). This SB identifies the affected serial numbers of the inner RDS susceptible to rivet fatigue failure and specifies procedures for performing inspections of TGB1 and TGB2 scavenge screens. This SB also specifies procedures for accomplishing applicable corrective actions if metallic particles are found. The FAA also reviewed CFM SB LEAP-1B-72-00-0258-01A-930A-C, Issue 002, dated September 15, 2020. This SB specifies procedures for replacement or rework of the inner RDS. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in ADDRESSES.

#### **Proposed AD Requirements in this NPRM**

This proposed AD would require initial and repetitive inspections of the TGB1 and TGB2 scavenge screens and, depending on the results of the inspections, replacement or rework of the affected inner RDS. As a mandatory terminating action to the initial and repetitive inspections of the TGB1 and TGB2 scavenge screens, this proposed AD would require replacement or rework of the affected inner RDS. This proposed AD would also

prohibit the installation of an engine with an affected inner RDS onto an airplane that already has one engine with an affected inner RDS installed.

### **Differences Between this Proposed AD and the Service Information**

The Accomplishment Instructions, paragraph 5.A.(3), of CFM LEAP-1B-72-00-0365-01A-930A-D specifies removing the engine if certain conditions exist, whereas this proposed AD would require replacement or rework of the affected inner RDS if certain conditions exist.

### **Costs of Compliance**

The FAA estimates that this AD, if adopted as proposed, would affect 34 engines installed on airplanes of U.S. registry.

The FAA estimates the following costs to comply with this proposed AD:

#### **Estimated costs**

<b>Action</b>	<b>Labor Cost</b>	<b>Parts Cost</b>	<b>Cost per product</b>	<b>Cost on U.S. operators</b>
Inspect TGB1 and TGB 2 scavenge screens	1 work-hour x \$85 per hour = \$85	\$0	\$85	\$2,890

For either replacement or rework of the inner RDS, depending on the option selected by the operator to comply with this AD, the FAA estimates the following costs:

<b>Action</b>	<b>Labor Cost</b>	<b>Parts Cost</b>	<b>Cost per product</b>
Replace inner RDS	600 work-hours x \$85 per hour = \$51,000	\$60,000	\$111,000
Rework inner RDS	600 work-hours x \$85 per hour = \$51,000	\$54,000	\$105,000

### **Authority for this Rulemaking**

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress

charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

### **Regulatory Findings**

The FAA determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this proposed regulation:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Would not affect intrastate aviation in Alaska, and
- (3) Would not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

### **List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

### **The Proposed Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

#### **PART 39 - AIRWORTHINESS DIRECTIVES**

- 1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

#### **§ 39.13 [Amended]**

- 2. The FAA amends § 39.13 by adding the following new airworthiness directive:

**CFM International, S.A.:** Docket No. FAA-2022-0515; Project Identifier AD-2022-00287-E.

**(a) Comments Due Date**

The FAA must receive comments on this airworthiness directive (AD) by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**(b) Affected ADs**

None.

**(c) Applicability**

This AD applies to CFM International, S.A. (CFM) LEAP-1B21, LEAP-1B23, LEAP-1B25, LEAP-1B27, LEAP-1B28, LEAP-1B28B1, LEAP-1B28B2, LEAP-1B28B2C, LEAP-1B28B3, LEAP-1B28BBJ1, and LEAP-1B28BBJ2 model turbofan engines with an installed inner radial drive shaft (RDS) with a serial number listed in Additional Information, paragraph 6.A., Table 1, of CFM Service Bulletin (SB) LEAP-1B-72-00-0365-01A-930A-D, Issue 003-00, dated April 26, 2022 (CFM LEAP-1B-72-00-0365-01A-930A-D).

**(d) Subject**

Joint Aircraft System Component (JASC) Code 7260, Turbine Engine Accessory Drive.

**(e) Unsafe Condition**

This AD was prompted by multiple commanded in-flight shutdowns (IFSDs) due to inner RDS failure. The FAA is issuing this AD to prevent failure of the inner RDS and subsequent IFSDs. The unsafe condition, if not addressed, could result in failure of one or more engines, loss of thrust control, and loss of the airplane.

**(f) Compliance**

Comply with this AD within the compliance times specified, unless already done.

**(g) Required Actions**

(1) Before exceeding 50 flight hours (FHs) after the effective date of this AD, and thereafter at intervals not to exceed 50 FHs from the previous inspection, inspect the transfer gearbox (TGB) TGB1 and TGB2 scavenge screens in accordance with the Accomplishment Instructions, paragraph 5.A.(1), of CFM LEAP-1B-72-00-0365-01A-930A-D.

(2) If, during any inspection required by paragraph (g)(1) of this AD, any metallic particles are found, before further flight, perform the actions in the Accomplishment Instructions, paragraphs 5.A.(2) and (3), of CFM LEAP-1B-72-00-0365-01A-930A-D. Where paragraph 5.A.(3)(b) of CFM LEAP-1B-72-00-0365-01A-930A-D specifies to remove the engine, this AD instead requires replacement or rework of the inner RDS in accordance with the Accomplishment Instructions, paragraph 5.A., of CFM SB LEAP-1B-72-00-0258-01A-930A-C Issue 002, dated September 15, 2020 (CFM SB LEAP-1B-72-00-0258-01A-930A-C).

**(h) Mandatory Terminating Action**

As a mandatory terminating action to the initial and repetitive inspections of the TGB1 and TGB2 scavenge screens required by paragraph (g)(1) of this AD, at the next piece-part exposure after the effective date of this AD, replace or rework the inner RDS in accordance with the Accomplishment Instructions, paragraph 5.A., of CFM SB LEAP-1B-72-00-0258-01A-930A-C.

**(i) Installation Prohibition**

After the effective date of this AD, do not install an engine with an affected inner RDS onto an airplane that already has one engine with an affected inner RDS installed.

**(j) Definitions**

For the purpose of this AD, “piece-part exposure” is when the fan frame shroud is separated from the fan hub.

**(k) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, ECO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in paragraph (l)(1) of this AD and email to: ANE-AD-AMOC@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

**(I) Related Information**

(1) For more information about this AD, contact Mehdi Lamnyi, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7743; email: Mehdi.Lamnyi@faa.gov.

(2) For service information identified in this AD, contact CFM International, S.A., Aviation Operations Center, 1 Neumann Way, M/D Room 285, Cincinnati, OH 45125; phone: (877) 432-3272; email: fleetsupport@ge.com. You may view this referenced service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222-5110.

Issued on May 5, 2022.

Lance T. Gant, Director,  
Compliance & Airworthiness Division,  
Aircraft Certification Service.

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